

UNIT 6

Data Analysis

Recommended Prior Knowledge

In preparation for this module you could cover the following topics; handling passwords to gain access to the operating system, applications software and data. Students will also require a basic knowledge of file management techniques including:

- creating, renaming, deleting and accessing directories/folders
- browsing a directory or folder
- creation of different file types.

Context

This unit can be studied on its own or in conjunction with other practical units.

Outline

This unit covers the following areas:

The use of spreadsheet software to model scenarios including:

- creating a model layout
- entering text
- entering numeric data
- entering formulae
- using functions
- copying formulae or functions
- selecting subsets of data (AND and OR)
- adjusting numeric data format and cell sizes
- saving model layout and formulae
- printing the data model displaying formulae
- printing the test model displaying values
- printing extracts.

Section	Learning Outcomes	Suggested Teaching Activities	Online Resources	Other resources
12.1	Create a data model	<p>Introduce sensible model layout so that additional data can be added where appropriate without restructuring the model. Demonstrate and develop the use of editing skills like; cut, copy, paste, drag and drop, fill, and formulae replication.</p> <p>Understand the importance of entering data into the model with 100% accuracy.</p> <p>Discuss the structure of formulae and develop the use of formulae to perform calculations, including; add, subtract, multiply, divide, indices.</p> <p>Teach the order of mathematical operations (as used within the software) and the importance of parenthesis (brackets) in ensuring that formulae work as expected.</p> <p>Develop an understanding of the function of absolute and relative cell referencing within formulae. Discuss the layout of, and plan the layout of worksheets with assigned areas for relative and absolute referencing.</p> <p>Develop an understanding of the function of named cells and ranges.</p> <p>Develop an understanding of commonly used spreadsheet functions like; sum, average, maximum, minimum, integer, rounding, counting, if and lookup.</p> <p>Develop an understanding of, and practice using nested formulae and functions.</p>		<p>Tutor preparation required:</p> <ul style="list-style-type: none"> • provide notes on commonly used formulae and functions • provide instructions showing what the students have to do.

Section	Learning Outcomes	Suggested Teaching Activities	Online Resources	Other resources
12.2	Test the data model	<p>Discuss the need for careful choice of test data.</p> <p>Discuss the use of test data, calculating and recording the expected output and mapping this against the actual output.</p> <p>Use practice exercises to develop data models and test that they produce the expected results.</p> <p>Choose test data and use this to test the models provided.</p>		<p>Tutor preparation required:</p> <ul style="list-style-type: none"> provide sample spreadsheet models, the purpose and expected results with a variety of formulae and functions for the students to check and see if they perform their given functions. Ensure that some of these models function correctly and some have errors (formulae or functions which have correct syntax), but do not perform the stated purpose provide instructions showing what the students have to do.
13.1	Select subsets of data	<p>Select subsets of data from provided spreadsheets or calculated lists using AND, OR, NOT, <, >, =, >=, <=, Wildcards and string matching.</p> <p>Ensure examples used contain multiple search criteria.</p>		<p>Tutor preparation required:</p> <ul style="list-style-type: none"> provide sample spreadsheet models that can be used for the extraction of subsets of data provide instructions showing what the students have to do.
14.1	Adjust display features	<p>Students must practice selecting data within the spreadsheet using highlighting to select only specified rows, columns, cell/s, as well as selecting the whole active spreadsheet.</p> <p>Develop the use of display features to enhance text, like: bold, underline, italic, and colour highlighting.</p> <p>Use practice exercises to format cell(s) as text, dates and numbers like; integer, percentage, decimal, specified number of decimal places, and a variety of different currency values.</p>	<p>Exercise 16</p> <p>Exercise 17</p>	<p>Tutor preparation required:</p> <ul style="list-style-type: none"> provide sample spreadsheet models that can be used for the extraction of subsets of data provide instructions showing what the students have to do.

Section	Learning Outcomes	Suggested Teaching Activities	Online Resources	Other resources
		<p>Develop skills in adjusting the row width, column height and text wrapping within a cell so that all data/labels/formulae are visible. Re-adjust after changing to formulae view if necessary.</p> <p>Develop the page layout skills to fit all the items onto one or more pages and to set the page orientation to either landscape or portrait.</p>		
15.1	Save and print data	Ensure that students can save their data and can print the whole or part of the spreadsheet showing formulae or values (including test data).		

Mini Assessment
Exercise 18

Unit 6 Exercises

EXERCISE 16

You work in Lavinia's Beauty Parlour. The price list is shown below. You should set up a model spreadsheet for each client, which shows (for a 6 month period):

- all the treatments that the client has undertaken
- the date the treatment was undertaken
- the cost of each treatment
- the total for each visit to the salon
- a running total for the six month period.

Lavinia's Beauty Parlour - Price List				
Service	Price (US\$)	Time	Service	Price (US\$) Time
FACIAL			HAND CARE	
Skin analysis	complimentary	20 min	Manicure	3 30 min
Mini facial	15	1 hr	French manicure	5 30 min
Deep cleansing	30	1 hr 30 min	Nail buffer	5 20 min
Firming lift intensive care	50	1 hr 30 min	Arm/hand massage	5 40 min
EYES			FOOT CARE	
Treatment with mask	5	2 hrs	Pedicure	3 30 min
Collagen treatment	10	30 min	Leg massage	5 45 min
Lifting treatment	12		Foot treatment	8 45 min
Brow tint	8	15 min		
Lash tint	10	15 min	BODY	
Lash and brow tint	15	30 min	Exfoliation and massage	30 2 hrs
Brow shaping	10	20 min	Massage	10 1 hr

Provide test data, enter it into the model.

Print 2 copies of the spreadsheet:

- one showing the values
- one showing the formulae.

Steps used to create this example solution as seen in (LAVINIAS.XLS):

1. Copy all descriptions and price data from price list table to a new spreadsheet table.
2. Create a new column and provide a unique job code for each treatment.
3. Remove all unwanted (e.g. Category titles like Eyes, Body, etc) data and blank rows.
4. Sort data by Code column.
5. Name this range.
6. Save and print a copy of this table for reference.
7. On a new sheet enter headings for the client treatment:

Date, Treatment Code, Treatment Description, Price, Running Total

8. In the Treatment Description and Price columns enter lookup functions to look up the Treatment Code in the lookup table named at step 5, and set to look up values in the appropriate columns to the right.
9. Copy these formulae down several rows to provide calculations for test data.
10. In the Running Total column enter a formula to add the new treatment cost to the previous total.
11. Save and print this sheet showing formulae used. Set page orientation to landscape for this printout and ensure that all data fits to one page.
12. When several dates of test data have been entered, use subtotal on change of date to provide costs of treatments on individual occasions.
13. Ensure that all prices are set to currency (US\$) and to two decimal places.
14. Ensure that all columns are wide enough to display all data.
15. Save and print the sheet showing costs of each visit.
16. Select a specific date for treatment and provide all details of treatments undertaken that day including overall total price of the treatments for that day.
17. Print this information.

EXERCISE 17

Painting Project¹

1. You have been asked to create a model to help clients know how many tins of paint they need to buy and how much they will spend to paint their house. Clients will provide the perimeter and the height of each room in the house. The program should calculate the number of tins needed and the total cost. The model should be able to receive data for at least 10 different rooms and should show the following information:

Client: XXX XXX

The table should show columns for Room description, Perimeter, Height, Number of tins needed per room, Cost for that room.

The table should then calculate the total cost for the client. Each tin can be used to cover 23m² of wall and its price is \$17.50.

Prepare the spreadsheet with this information and try it with different data for 2 different clients who live in different houses.

Place the model in one sheet, and create a different sheet for each client.

Print one of the clients' spreadsheets showing the results and again showing the formulae. Include your name and date in each printout.

2. Extending the spreadsheet

The store now has several types of paint tins.

They are of different sizes and will cover different wall areas.

They also have different prices.

The following table shows the information of the different types of paints available at the store.

CODE	TYPE	AREA COVERED (m2)	COST
1102	Vencedor	35	34.00
1305	Titan	27	22.50
1432	Rocky	12	17.50
2643	Super Paint	30	32.00
2781	Milkisant	22	18.90
4005	Aguamarine	32	33.00

Modify your model to allow the client to choose a different type of paint for each room.

Print the table for one client showing the results and showing the formulae.

Include your name and date.

¹ Acknowledgements and thanks to Elizabeth Orams for this contribution

EXERCISE 18

1. Create a model with the following column headings:

MODEL#
PRODUCT NAME
COST PRICE
SELLING PRICE
QUANTITY
VALUE
MINIMUM STOCK
REORDER

2. In an empty cell above or to the right of this data block insert the following text and to the right of this the following number:

MARK UP PERCENTAGE 30

3. On a row below the headings enter the following data to begin the test data structure:

MODEL#
PRODUCT NAME
COST PRICE
QUANTITY
MINIMUM STOCK

C100 GLS
Personal Copier
\$827.48
891
900

4. In the *SELLING PRICE* column enter a formula which calculates a mark-up for selling price of 30%, using the *MARKUP PERCENTAGE* cell value as an absolute cell reference.
5. In the *VALUE* column enter a formula which calculates the sales value of the stock from the *SELLING PRICE* and *QUANTITY* in stock.
6. In the *REORDER* column enter a conditional function to return **Yes** if the product needs to be reordered and **No** if the stock level is above the minimum.
7. Save this structure for the spreadsheet.
Set page orientation to landscape and adjust the print to fit on one page.
Print one copy showing formulae used.
Remember to print your name and today's date on the printout.

8. Now enter the following data into your spreadsheet:

MODEL#
PRODUCT NAME
COST PRICE
QUANTITY
MINIMUM STOCK

C110 GLS
Personal Copier
992.98
606
500

C200 GLS
Personal Plus Copier
1,429.89
80
100

C300 GLS
Business Copier
2,470.85
590
500

C310 GLS
Business Copier
2,965.02
340
300

C400 GLS
Professional Copier
4,269.62
49
50

C410 GLS
Professional Copier
5,123.54
91
100

C500 GLS
Professional Plus Copier
7,377.90
759
500

F100 G
Personal Fax
607.96
495
500

F200 G
Personal Plus Fax
729.55
463
450

F350 G
Business Fax
1,260.66
404
400

F400 G
Professional Fax
1,512.80
71
100

F550 G
Professional Plus Fax
2,614.11
150
100

F600 G
Compact Professional Plus Fax
3,136.94
992
500

P100 G
Personal Printer - Dot Matrix
307.95
77
90

P310 G
Personal Plus Printer - Ink Jet
708.32
290
300

P500 G
Business Printer - Laser
1,770.78
592
500

P1000 G
Professional Printer - Laser PostScript
3,451.56
150
100

9. Copy the formulae in the columns *SELLING PRICE*, *VALUE* and *REORDER* to apply to all the products in the list.
10. Widen all columns to ensure all data is displayed.
11. Use the **SUM** function to total the Sales value of the stock.
12. Set the data in the columns *COST PRICE*, *SELLING PRICE*, and *VALUE* to two decimal places and US dollar currency format.
Set the numeric data in the *QUANTITY* and *MINIMUM STOCK* columns to integer value.
13. Save a copy of this spreadsheet and print one copy in landscape orientation, fitting all data onto one page
14. Find all products that need to be reordered.
Print a copy of all these products.
15. From the full list of products, extract all those that are fax machines, and from these only those where the number in stock is less than 200.
16. Print this list of products.